Predication and movement in passive[☆]

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Abstract

This paper reconciles conflicting evidence on the nature of adjectival passives. Some evidence suggests that externalization of an internal argument in adjectival passives is a lexical operation not involving syntactic movement, while other evidence suggests that adjectival passive participles project an internal argument in the syntax. It is proposed that a subject may be base generated in a predicate-external non-theta position termed 'PrP' when it binds a null anaphor (PRO) in a theta position. Verbal participles are formed external to PrP while adjectival participles are formed internal to PrP. The possibility of externalization of an internal argument, whether by binding or movement, is modulated by the passive morphology in the same way in both cases. According to this analysis, adjectival passives project an internal argument (PRO) which is bound by a subject base generated in PrP, deriving externalization without movement in a manner compatible with the presence of internal syntactic structure in adjectival passives.
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1. Introduction

Syntactic structures consist of layered lexical and inflectional domains (Hale and Keyser, 1993; Chomsky, 1993; Sportiche, 1995; Travis, 2000, and others). A-movement preserves hierarchical relations in the lexical layer, a state of affairs guaranteed by the Minimal Link Condition (MLC) in Minimalist Theory (Chomsky and Lasnik, 1993; Chomsky, 2001). The family of constructions falling under the rubrik ''passive'' shows a deviation from this pattern in which a non-highest argument in the lexical layer is mapped to the highest case position in the inflectional layer. Recent analyses of the passive characterize it as involving a mechanism, marked by the passive morphology, that affects the syntax in a way that sidesteps minimality, allowing an internal argument to move over a higher argument that would otherwise inhibit promotion (Jaeggli, 1986; Baker et al., 1989; Collins, 2005). The present study examines a class of syntactic contexts in English that seem to show externalization of an internal argument without movement. In particular, while verbal passive constructions show hallmarks of movement, adjectival passives do not. In this paper, an analysis of linking without movement is formalized that distinguishes the behavior of verbal and adjectival passives while maintaining the commonality among passive constructions that the possibility of externalization of an internal argument is related to manipulation of the hierarchical order of external and internal arguments within the predicate, affected by the passive morphology.

The predicate anaphor *do so* represents an eventive verb phrase (1a), while the predicate anaphor *so* represents an adjective phrase (1b), prepositional phrase (1c), or, subject to some variation in individual speakers' judgments,

a predicative noun phrase (1d) (Lakoff and Ross, 1966; Ross, 1972; Hankamer and Sag, 1976; Ward and Kehler, 2005, and others).

(1) a. Mary [read the newspaper]$_i$, and John [did so]$_i$, too.
     b. The box is [full of dirt]$_i$, and the bucket is [so]$_i$, too.
     c. Mary is [in legal trouble]$_i$, and John is [so]$_i$, too.
     d. Mary is [a specialist in antiquities]$_i$, and John is [so]$_i$, too.

Note that *do* in *do so* is not the dummy auxiliary *do* that occurs in auxiliary position in negative constructions (2a) and verb phrase ellipsis constructions (2b) and that undergoes subject-auxiliary inversion in questions (3). *Do* of *do so* has the distribution of a main verb and co-occurs with auxiliaries (4a), including the dummy auxiliary *do* (4b) (Déchaine, 1994).

(2) a. Mary did not read the newspaper.
     b. Mary did [$_{VP}$ e]

(3) a. Did Mary not read the newspaper?
     b. Did John [$_{VP}$ e]?

(4) a. Mary was doing so.
     b. Mary did not do so.

The VP anaphor *do so* does not permit extraction of an internal argument of the VP it represents, in contrast to VP ellipsis, which admits extraction (Fiengo and May, 1994, who note that Carlson, 1977 and Haïk, 1987 mention the fact in passing). *Do so* does not tolerate wh-movement (5a) or quantifier raising (5b) (examples modified slightly from Fiengo and May, p. 247), nor movement of a degree operator (5c) associated with an internal argument. Nor does it tolerate A-movement of an object in a passive environment (5d) (Hallman, 2004; Houser, 2010).

(5) a. *I know which book Mary read, and which book Bill didn't do so.
     b. *Max talked to everyone that Bill did so.
     c. *Mary read more books than Max did so.
     d. *These books were left in the classroom, and this cell phone was done so, too.

The examples above are grammatical with VP-ellipsis instead of *do so* anaphora, indicating that in ellipsis contexts the elided structure is present in the syntax, though unpronounced (6). Such structures provide a base position for the moved operator, which *do so* apparently does not. Following Akmajian (1970), Bresnan (1971), Hankamer and Sag (1976), Fiengo and May (1994), and others, I conclude that *do so* is a pro-form whose interpretation is reconstructed from that of its antecedent by LF copying of its antecedent into the position occupied by *do so*. Since *do so* is only reconstructed at LF, there is no position in the base structure for the overtly moved operator in (5), rendering these examples ungrammatical. In contrast, as Fiengo and May (1994) and Merchant (1999) argue, ellipsis involves an unpronounced predicate, subject to an identity requirement with its antecedent, that admits surface movement of operators base generated internal to the unpronounced predicate.

(6) a. I know which book Mary read, and which book Bill didn't.
     b. Max talked to everyone that Bill did.
     c. Mary read more books than Max did.
     d. These books were left in the classroom, and this phone was, too.

The pro-form *so* representing non-verbal predicates shares with *do so* the inadmissability of extraction of an internal argument of the constituent represented by *so*, illustrated here by degree operator movement (7). This analogy suggests that like *do so*, *so* has no internal structure of its own, but is interpreted by LF copying of its antecedent.

(7) a. The box is full of more dirt than the bucket is (*so).
     b. Mary is in more legal trouble than John is (*so).
     c. Mary is a specialist in more areas than John is (*so).

Both *so* and *do so* allow sloppy-identity readings of variables contained in their antecedents. The sentence in (8a) may be interpreted as asserting that John lost his own keys, not Mary's, and (8b) may be interpreted as asserting that John is proud of his own students, not Mary's. A pronoun in the antecedent of *do so* and *so* in (8a) and (8b) respectively may be reindexed in the reconstruction of the interpretation of *do so* and *so* (Ross, 1967).

(8)   a.   Mary lost her keys, and John did so, too.
      b.   Mary is proud of her students, and John is so, too.

2. Verbal and adjectival participles

Wasow (1977) observes a number of differences distinguishing passive participles that occur in adjective-selecting environments such as complement of *seem*, *look*, *sound*, *appear*, *remain*, and verb-selecting environments such as the progressive and complement of *have*. Complement of *be* admits both verbs and adjectives. While most transitive verbs can be passivized, participles occur in adjective-selecting environments to an extent dependent on the meaning of the verb and the plausibility of the semantic context in ways described by Wasow and by Maienborn (2007, 2009). Some examples are illustrated in (9). As the continuations in (10) illustrate, *so* may have an adjectival participle antecedent.

(9)   a.   This ship appears damaged.
      b.   The violin sounds expertly repaired.
      c.   These prices seem heavily reduced.
      d.   The city remains ravaged by war.

(10) a.   This ship appears damaged, and the dock appears so, too.
      b.   The violin sounds expertly repaired, and the cello sounds so, too.
      c.   These prices seem heavily reduced, and the prices at Target seem so, too.
      d.   The city remains ravaged by war, and the countryside remains so, too.

The fact that *so* may have an adjectival participle as antecedent is puzzling in light of the behavior of *so* and *do so* discussed previously. *Do so* does not allow an internal argument of the verb it stands for to be externalized. However, when *so* has an adjectival passive participle antecedent (derived from a transitive verb), *so* systematically admits externalization of the theme argument of the corresponding transitive verb. The contrast at issue is illustrated in (11).

(11) a.   *The ship was damaged, and the dock was done so, too.
      b.   The ship appears damaged, and the dock appears so, too.

Both (11a) and (11b) attribute the theme theta role of the underlying verb *damage* to the ship. In (11a), *the dock* is not able to be construed as the theme of *damage*, because to be so construed, it would have to be generated in the theme configuration with *damage* in the base structure, which is not possible, since that configuration (syntactic sister of the underlying verb *damage*) does not occur in the clause that *the dock* is the subject of. This observation is expected in light of the general impossibility of extraction of an internal argument from a predicate anaphor. It is (11b) that is unexpected, since the only difference between (11a) and (11b) is that in (11b), *damaged* is interpreted adjectivally (for which reason the non-verbal predicate anaphor *so* surfaces in the second clause instead of verbal *do so*). Yet here, it seems possible for *the dock* to be construed as theme of underlying *damage*, though it does not appear that this relation is a reflection of movement from a theta position, since as in (7), no theta position presents itself in (11b) that *the dock* could have moved from. The morpheme *so* in (11b) and other examples in which it refers to an adjectival participial antecedent, shares with *so* in other contexts the impossibility of extraction of internal arguments other than the externalized theme, as (12) illustrates in connection with degree phrase extraction, again in contrast to predicate ellipsis.

(12) a.   The ship looks more damaged than the dock looks (*so).
      b.   The violin looks more expertly repaired than the cello looks (*so)
      c.   The prices at Target look more heavily reduced than the prices at Walmart look (*so).
      d.   The city looks more ravaged by war than the countryside looks (*so).

These data appear to support Wasow's (1977) analysis of the difference between adjectival and verbal participles. Wasow claims that verbal participles are derived in the syntax in a process that includes syntactic movement of the theme to the subject position. Adjectival participles, on the other hand, are formed in the lexicon, prior to insertion in the syntax, by a process that includes externalization of the theme theta role, an effect he characterizes as in (13) (p. 355). The participial morpheme *-en* derives an adjective from a verb, accompanied by advancement of role II (highest internal argument in his nomenclature, which he borrows from Lexical Relational Grammar) to role I (external argument).

(13)   *-en*$_{V_A}$ (II) = I

As a result, the theme is already externalized when the predicate is inserted into the syntax, and no syntactic movement relates the theme position in the predicate to the syntactic subject position—there is no theme position in the syntax at all in such cases. This analysis presents an explanation for the contrast in (11). *So* may strand the theme of the verb underlying the participle it represents because that theme does not move from within the participle, in contrast to *do so*, which, since it only represents verbal predicates but yet bleeds movement, may not be passivized.

However, Embick (2004) presents data that cast doubt on the correctness of Wasow's lexical analysis of adjectival participles, and instead argues that all passive participles are formed in the syntax (see also Emonds, 2000, ch. 5). Embick points out that adjectival participles may be formed from verb phrases with resultative secondary predicates, as in (14). The fact that the secondary predicate can be phrasal (15) (Embick's (75)) militates against an analysis in which expressions like *hammer flat* are formed in the lexicon as a kind of compound. Embick concludes that verbal and adjectival participles, including participial phrases like *hammer flat* are formed in the syntax.

(14)   a.   The metal remained [hammered flat].
        b.   This door looks [kicked open].

(15)   The metal is hammered [flatter than a pancake that has been run over by a steamroller and stomped on by elephants].

Of particular significance are participles in which an unergative verb combines with a resultative secondary predicate, and inherits the argument of the secondary predicate as its object. Some examples of this type are shown in (16) (due to Levin and Rappaport Hovav (1995), some slightly modified). Kayne (1984), Hoekstra (1988), Carrier and Randall (1992), Levin and Rappaport Hovav and others claim that the object in these cases is semantically selected by the resultative predicate, since the verbs in these examples are intransitive, but that that object, though thematically licensed by the resultative predicate, functions syntactically as object of the main verb, since, among other things, passivization of the verb results in promotion of that object to subject (17). Consequently, the secondary predicate is obligatory in these cases, since it is what assigns a theta role to the object.

(16)   a.   The joggers ran the grass *(bare).
        b.   The dog barked the baby *(awake).
        c.   The guests drank the teapot *(dry).
        d.   John drove the engine *(clean).

(17)   a.   The grass was run *(bare).
        b.   The baby was barked *(awake).
        c.   The teapot was drunk *(dry).
        d.   The engine was driven *(clean).

Verbal passive structures like those in (17) have adjectival counterparts as well, illustrated in (18). Such examples are not as productive as their verbal counterparts. Maienborn (2007, 2009) presents a pragmatic explanation for the lack of productivity in such examples that relates it to the fact that the property they attribute to their subject is not composed solely from the description they contain, but includes a context-dependent component as well that is more easily retrievable in some contexts than in others. It is easy to imagine that the particular pattern of bareness that a patch of grass displays indicates that it has emerged as a result of being run over. It is quite a bit harder to imagine that the cry of a baby could indicate that it has been barked awake and not awakened in some other manner. But this pragmatic consideration is not a criterion of grammaticality. If this particular baby in fact always cries louder when it gets barked awake, then we might recognize that it has been barked awake by the sound of it and say *The baby sounds barked awake again*. I return to the special interpretational characteristics of resultant state adjectival participles and their productivity below.

(18)   a.   The grass looks run *(bare).
        b.   The baby sounds barked *(awake).
        c.   The teapot seems drunk *(dry).
        d.   The engine seems driven *(clean).

These examples are particularly significant because the underlying object in cases like (18) is not a semantic argument of the verb bearing the adjectivizing morphology *-en*. It therefore does not bear that verb's role II, since these verbs have no lexical role II. Since Wasow's generalization in (13) manipulates the argument structure of the verb in the lexicon, only an argument of the participialized verb may be externalized. A non-argument such as the objects in (18) is predicted to be

impossible to externalize except in the syntax after concatenation of the verb with its secondary predicate. Once again, the possibility that the verb and its secondary predicate constitute a unit in the lexicon is refuted by examples like (15).

An adjectival resultative construction may function as antecedent to the pro-form *so*. In these cases, the subject of the second clause is able to thematically link to the secondary predicate within the constituent that *so* represents. As before, the possibility that movement is involved in establishing this linking relationship seems unpromising, since predicate anaphors like *so* do not contain internal structure that could host the moved phase in the base structure.

(19)   a.   The grass seems run bare, and the astroturf seems so, too.
       b.   The baby seems barked awake, and the neighbors seem so, too.
       c.   The teapot seems drunk dry, and the coffee pot seems so, too.
       d.   The engine seems driven clean, and the transmission seems so, too.

These data present a circumstance in which a subject is able to link to an internal theta role without movement. Several precedents for the notion of externalization without movement are found in the linguistic literature. One is Williams' (1980) notion of 'predication'. According to Williams, a DP (NP in his nomenclature) is interpreted as the subject of a co-indexed predicate that it stands in the mutual c-command relation with, as in (20). The index on the predicate is interpreted as an abstraction operator (Williams, 1980, fn. 2). The abstraction operator links the subject to the unique theta role that remains unsaturated at the point when the subject and predicate are merged. There may be only one such unsaturated theta role in predication structures, according to Williams, since a phrase may bear only one index. Since predicates are saturated from the bottom of the theta hierarchy up, a subject may link by predication only to the highest argument in a predicate's theta grid. From this perspective, the puzzle that the data in (10) and (19) pose is how the passive morphology permits the abstraction operator to bind the internal argument of the passivized verb, rather the higher external argument. An analysis that unifies the role of the passive morphology in verbal and adjectival constructions must characterize the impossibility of abstraction over the agent argument in adjectival passives in the same way as the impossibility of raising of the agent argument in verbal passives. Such an analysis is pursued below.

(20)   John$_i$ [became rich]$_i$

An additional precedent for a non-movement analysis of externalization is found in Diesing (1992). Diesing claims that subjects of individual level predicates obligatorily receive a strong (non-existential) interpretation because they are not able to reconstruct into the domain of existential closure (Heim, 1982), which Diesing claims is restricted to the verb phrase. She concludes that since movement chains show reconstruction effects, the failure of reconstruction in individual level contexts is due to the fact that no movement chain relates the subject to a theta position in the verb phrase. The structure of *Firemen are intelligent* is that in (21), where the subject, base generated in IP, binds the null pronominal PRO in a theta position. Since PRO must be locally bound, it may only, as in Williams' analysis, represent the highest argument of its predicate.

(21)   [$_{IP}$ Firemen$_i$ are [$_{VP}$ PRO$_i$ intelligent]]

In the context of both Williams' and Diesing's analyses of linking without movement, the puzzling thing about adjectival passives is that the subject links to a non-highest theta role. The participles in (10) and (19) are all derived from verbs whose theta grid contains an agent. Embick shows that the proposal that participle formation results in a rearrangement of the verb's theta grid is not tenable. Instead, Embick, following Kratzer (1996, 2000), claims that adjectival passives lack the syntactic structure responsible for the introduction of an agent (see also Anagnostopoulou, 2003, who notes that this feature of adjectival passives is not language universal).

Kratzer claims that transitive verbs are constructed by the merger of a syntactic head she terms 'Voice' ('v$_{AG}$' in Embick's nomenclature, here simply '(little) v') to an underlying VP ('v$_{FIENT}$' in Embick's nomenclature, here '(big) VP') that licenses a theme and other internal arguments (if present), as well as an event argument. The agent is introduced in the specifier of the Voice head. Adjectival participial morphology (here labeled 'Asp', following Embick) derives an adjective directly from the underlying VP, blocking the syntactic introduction of an agent in participles. This proposal entails that the theme in examples such as (10) is in fact the highest argument represented in the predicate at the point at which the participle is derived. While the verb phrase underlying *John opened the door* looks like the vP in (22a) in the Kratzer/ Embick approach, we might characterize the structure of the adjectival participle underlying *The door appears opened* as the AspP in (22b), where the subject *the door* binds the semantic variable *x* from a position external to the predicate.

(22)   a.   [$_{TP}$ John$_i$ [+PAST]$_T$ [$_{vP}$ t$_i$ [$_{VP}$ open the door]]]
       b.   [$_{TP}$ The door$_i$ appears [$_{AspP}$ -en$_{Asp}$ [$_{VP}$ open x$_i$]]]

Chomsky (1981, ch. 6) examines the behavior of three types of phonologically empty DP—PRO, DP-trace ('NP-trace' in his nomenclature) and variable. Variables are bound by an antecedent in an A′ position, while DP-trace must be governed and PRO must be ungoverned. The expression *x* in (22b) is not a variable in Chomsky's sense, since its antecedent is in the A-position [spec,TP]. The preceding discussion makes evident that *x* is not an DP-trace, since it can be related to an antecedent in contexts where movement is impossible. I conclude that *x* is PRO, and therefore that the position of *x* in (22b) is an ungoverned position, and grant that this conclusion may be refined in the course of future inquiry into the typology of null categories. Accordingly, PRO marks the bound object of an adjectival participle in the structures to follow.

The claim that the internal argument in adjectival passives is promoted as a result of the wholesale elimination of the external argument from the syntax is supported by the observation that unlike verbal passives (23a), adjectival passives do not readily license the occurrence of an agent in a *by*-phrase or other agent-oriented material. See e.g. Pesetsky (1987), Anagnostopoulou (2003). Embick cites (23b) (fn. 1, p. 357).

(23) a.   The door was opened by John.
      b.   *The door remained opened by John.

The contrast in (23) in turn suggests that verbal passives (23a) contain the agent licensing structure found in active constructions (Roeper, 1987; Jaeggli, 1986; Baker et al., 1989; Anagnostopoulou, 2003; Collins, 2005, and others; see also Landau, 2010 for arguments in favor of the syntactic projection of implicit arguments in general). Embick proposes that verbal passive participles are derived by application of the participial morphology at a higher syntactic level than in adjectival passives, one that includes the agent-introducing vP. The base structure of the passive participle underlying (23a) is that in (24) according to Embick.

(24) [$_{AspP}$ -en$_{Asp}$ [$_{vP}$ John [$_{VP}$ open the door]]]

This structure ensures that an agent is present in verbal passives, but does not clarify by virtue of what aspect of (24) the agent *John* is relegated to a *by*-phrase in the derived sentence and the theme *the door* is able to promote to subject over the base position of the agent. On this view then, whatever syntactic transformation is responsible for the demotion of the agent in the passive predicate in (24), it is distinct from the attribute of the adjectival participle in (22b) responsible for the absence of the agent there, since adjectival participles do not involve demotion but rather the absence of an agent in the base structure. Consequently, the structures for the verbal and adjectival participles in (24) and (22b) respectively do not represent a unified characterization of the effect of passivization on the status of the external argument. Evidence suggesting that a unified treatment is called for is discussed below.

Grimshaw (1990) contests the empirical observation that resultant state adjectival participles do not admit *by*-phrases, citing (25). Wasow (1977) cites the examples in (26). In these examples the adjectival prefix *un-* clarifies that these participles are adjectival.

(25) Fred remains completely unperturbed by his students' behavior.

(26) a.   Our products are untouched by human hands.
      b.   All his claims have been unsupported by data.
      c.   The island was uninhabited by humans.

Similarly, Pesetsky (1995:119) cites (27) in support of the claim that adjectival passivization need not eliminate the external argument of the underlying verb.

(27) a.   The ruins of Troy were unseen by anyone until Schliemann began his excavations.
      b.   The restaurant remained closed by the police for a long time.
      c.   Sue was much misunderstood by her peers.

It is clear though that *by*-phrases in adjectival passives are a great deal less productive than in verbal passives. Specifically, like adjectival participles of resultative verb phrases discussed above, they are more reliant on the presence of a supporting context than *by*-phrases in verbal passives. For example, if we know that John is a sloppy dish washer, and we find a pile of dirty dishes in the drying rack, we might assert (28a). Similarly, (28b) is licit in a context in which everyone is obligated to open the door, and John neglects his obligation. The corresponding verbal passives in (29) do not imply that John is a sloppy dishwasher or that he was ever obligated to open the door.

(28) a.   These dishes look washed by John.
      b.   The door remained unopened by John

(29) a.   These dishes were washed by John.
      b.   This door was not opened by John.

Similarly, Maienborn (2009) cites the example in (30) from German, where the adjectival participle *cited by Chomsky* implies, above and beyond what it asserts, that the paper is significant (that the passive in (30) is adjectival is indicated by the choice of auxiliary in German, on which see Kratzer, 2000; both Kratzer and Anagnostopoulou, 2003 claim that German passive participles are semantically and syntactically parallel to their English translational equivalents).

(30)   Das Manuskript ist von Chomsky zitiert.
         the manuscript is by   Chomsky cited
         'The manuscript is cited by Chomsky.'

Maienborn claims that while the participial morphology in such cases is merely passivizing, as it is in verbal passives, adjectival participles are derived by the adjectivization of the participle. The (null) adjectivizing morphology introduces a property that can be attributed to the theme by virtue of the event the underlying verb describes, but is not necessarily itself the resultant state of that event, illustrated in (31) (Maienborn's (20)). This morpheme combines with a predicate P, an individual x and a state s and asserts that there is an event e of type P from which s results and that s is the state of x having the context-dependent property Q.

(31) $\lambda P \lambda x \lambda s \, \exists e \, [s : Q(x) \text{ and result } (e, s) \text{ and } P(e)]$

The normal result of an event lends itself naturally to the identification of Q. In (32a), Q is the property of having been washed and in (32b), of not having been opened. The *by*-phrases in (28) and (30) contribute to the description P and therefore imply that the agency of the individual named in the *by*-phrase plays a role in the determination of Q. As a result, (28a) requires that Q be a property that dishes have by virtue of having been washed by John. The specification of the agent implies that this property is distinct from the property that dishes normally have by virtue of having been washed, which is the case in the context described above. Having been cited by Chomsky implies that the manuscript named in (30) is significant, in contrast to having been cited by someone of less public stature.

(32) a.   These dishes look washed.
      b.   The door remained unopened.

Similarly, a research project involving excessive bureaucratic oversight, a hallmark of European Research Council funded projects, might be described as in (33a), and secret documents that give the appearance of having been intentionally leaked might be described as in (33b), where the agent-oriented adverb *intentionally* discloses the presence of a hidden agent (Jackendoff, 1972). The *by*-phrases in (33c) and (33d) similarly contribute to a *de re* description of the countryside and current interest rates respectively.

(33) a.   This project looks funded by the ERC.
      b.   These documents appear intentionally leaked.
      c.   The countryside remains ravaged by war.
      d.   Current interest rates seem driven by inflation.

This characterization of the meaning of adjectival passive participles offers insight into the pair of examples cited above from Embick and Pesetsky, repeated in (34). In Pesetsky's example (34a), the property Q attributed to the restaurant is naturally inferred to be the property of being prohibited by the police from reopening. Embick's (34b) offers no obvious contextually retrievable value for Q other than the asserted property of having been opened by John. But this property holds in perpetuity and is therefore infelicitously tautological in combination with the main verb *remain* (see Kratzer, 2000 on the semantic conflict between resultant state adjectival participles and the adverb *still*). The asterisk in (34b) reflects the assertion's pragmatic incoherence rather than ungrammaticality.

(34) a.   The restaurant remained closed by the police for a long time.
      b.   *The door remained opened by John.

A further indication that adjectival participles contain a representation of the external argument of the underlying verb is that external arguments may be incorporated in adjectival passives, as the attested expressions in (35) illustrate. While (35a–e) involve inanimate incorporated nouns (potential instruments), the agenthood of the animate incorporated nouns in (35f–l) seems uncontroversial.

(35) a. NSF-funded project
   b. war-ravaged countryside
   c. interest-driven inflation
   d. technology-bred problems
   e. state-sponsored terrorism
   f. dentist-recommended toothpaste
   g. voter-sponsored initiative
   h. kid-tested, mother-approved [cereal][1]
   i. lady-driven car[2]
   j. bird-hit jet[3]
   k. Slash-signed guitar[4]
   l. Sam-made Pizza[5]

Insofar as the 'agent of' relation is subserved by the same syntactic configuration in all contexts where an agent occurs, these data indicate that adjectival participles contain the relevant structure, e.g. vP in Embick's analysis, and yet that they may be predicated of an internal argument even when this agent is overtly expressed within the participle as an incorporated noun or *by*-phrase.

Evidence indicating that verbal and resultant state adjectival participles do not differ in the presence of an external argument supports a unified analysis of the demotion of the external argument in passive constructions, whether verbal or adjectival, that is, an analysis in which the passive morphology affects the external argument in both cases in a way that makes an internal argument accessible to syntactic positions outside the predicate, whether by movement or binding. I articulate an analysis below that posits that resultant state adjectival passives contain the full thematic structure of verbal passives, contrary to Embick's characterization. I follow Embick though in relating the difference between verbal and adjectival passives to a difference in placement of the passivizing morphology. Resultant state participles are those that describe the state resulting from the event described by the underlying verb (Parsons, 1990; Kratzer, 2000) or an *ad hoc* property accruing to the subject by virtue of that event (Maienborn, 2009). These are distinct from 'target state' participles, which do not implicate a precipitating event. One can speak of a hidden valley without implying that anyone hid the valley. *Hidden* functions as a target state participle here. Embick analyses adjectives such as *open* and *dry* as target state participles related to the verbs *open* and *dry*, with null participial morphology. Embick's observation that these, and target state participles in general, do not license an agent is clearly correct (cf. *The door remains open (*by John)* and *The clothes appear dry (*by the sun)*). The notion that these do not contain a vP layer therefore appears to be a correct description of target state participles, in contrast to resultant state participles. Embick attributes additional structure to the category I label 'VP' related to the derivation of target state participles. The proposal I make below for the derivation of resultant state participles is compatible with Embick's analysis of target state participles, to which I have nothing to add.

3. Analysis

I propose that a subject is base generated external to the predicate it is subject of when a theta position in the predicate is occupied by the null category PRO. Specifically, a subject is base generated in the specifier of the projection Pr[edication]P, a construct I borrow from Bowers (1993). In the analysis presented here, in contrast to Bowers' proposal, PrP functions as a non-theta position, and co-occurs in the structure with the theta position for the external argument, which I label 'vP', following Embick and others. The fact that the subject generated in [spec,PrP] may be a quantifier entails that the constituent it merges with (Pr′) may be interpreted as a property abstracted over PRO. The external subject, then,
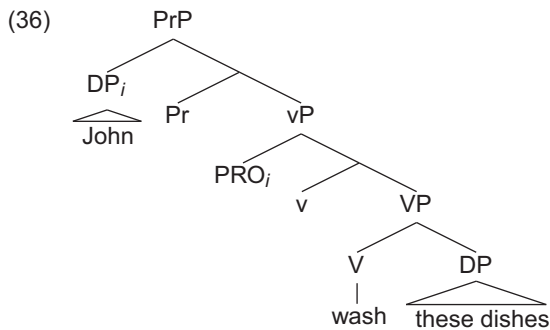
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[1] Slogan on ''Kix'' cereal boxes.
[2] In an LA Recycler classified ad for a used car, apparently commenting on the condition of the car.
[3] In the CNN.com headline ''Bird-hit jet in emergency landing''.
[4] In a Craigslist Los Angeles ad for a guitar signed by the former Guns 'n' Roses guitarist. Also attested is ''celebrity-autographed memorabilia''.
[5] Uttered by Jessica Rett, referring to pizza made by Sam Cumming.

does not receive a theta role, rather, it integrates with its syntactic context through function application and satisfies the principle of Full Interpretation in this manner (Chomsky, 1993). In this configuration, PRO must be present somewhere in the predicate lest the structure be ruled out by the ban on vacuous quantification in natural language (Chomsky, 1991:438). The discussion below concerning locality in the dependency between the external subject and PRO actually concerns the relation between the abstraction operator and PRO, but for perspicuity's sake I continue to speak of the external subject as the antecedent of PRO. An active structure like *John washed these dishes* displays the predicate structure (excluding TP, etc.) in (36). In this structure, *so* may replace the complement of PrP (here vP), in which case *do* occurs in Pr, as described in more detail in section 3.2.

(36)

```
              PrP
          ┌────┴────┐
        DPᵢ         ┌─┴──┐
        ╱╲         Pr    vP
      John           ┌────┴────┐
                   PROᵢ      ┌──┴──┐
                             v     VP
                                ┌──┴───┐
                                V      DP
                                │      ╱╲
                              wash   these dishes
```

The derivation of the passive word order without the passive morphology (e.g. **These dishes*theme *washed John*agent) represents a minimality violation. The binding configuration illustrated by the indices in (37) is ruled out because *John* represents a closer potential antecedent for PRO than *these dishes* in [spec,PrP]. If PRO in the theme position were locally bound by the agent in [spec,vP] instead, it would leave the element in [spec,PrP] altogether unintegrated into the semantic composition of the sentence, which in turn is ruled out by the proscription on vacuous quantification.

(37)   *[PrP These dishesᵢ [vP John [VP washed PROᵢ]]]

The structure proposed here is similar to that proposed by Harley (2013) for Hiaki (Uto-Aztecan) on the basis of similar kinds of considerations. Harley observes that an applicative morpheme that introduces a benefactee applies morphologically outside a causative morpheme that introduces an agent. But the agent is by various tests syntactically superior to the benefactee. Hence the syntactic order of arguments and the order of the morphemes that introduce them do not align. She concludes that the external argument is actually not introduced directly by the causative morpheme, which heads vP, but is base generated in a higher projection she terms VoiceP, which therefore plays a role similar to that of PrP in the present analysis. The applicative argument and its licensor ApplP lies in between VoiceP and vP. As in the present analysis, Harley reconciles evidence for a low agent (a morphologically low causative morpheme) with the syntactically high surface position of the agent (its occurrence above the applicative argument) by positing two different projections associated with the two observations. In the present proposal, *by*-phrases and incorporated agents in adjectival participles represent evidence for low agents while the possibility of externalization under *so*-replacement represents evidence for high agents. Harley's proposal draws on Pylkkänen's (2002) separation of the syntactic locus of agentivity and causativity, which in turn resembles Ross's (1972) claim that action sentences are embedded under the main verb *do*, whose subject controls the subject of the subordinate predicate. The present analysis contributes to this body of research the observation that the higher of the two subject positions is not a theta position, based on the observations above about the behavior of *(do) so*, and presents an analysis, developed below, of the manner in which this predicate-external subject is linked to a theta position in its c-command domain. Aside from this divergence and some substantial notational differences, the analysis I present in section 3.2 of the distribution of *(do) so* is essentially that of Ross. First, the following section describes how the structural differentiation of PrP and vP interacts with passivization to derive the behavior of verbal and adjectival passives.

3.1. The structure of verbal and adjectival passive participles

Passivization apparently affects the structure in (37) in such a way as to circumvent the minimality violation there. I adopt for the purposes of this account the analysis of passive in Collins (2005), though I believe the general idea pursued
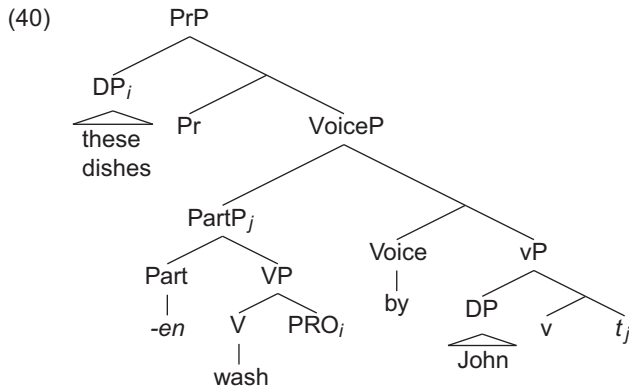
here, that externalization of the theme involves movement in verbal passives but not in adjectival passives, though both of these are syntactically derived, is compatible with other accounts. What makes Collins' account suitable for the present purposes is that it is compatible with the claim advanced here that agent-licensing syntactic structure occurs in both verbal and (resultant state) adjectival passives, in contrast to analyses of the adjectival passive that claim that no agent is projected in the syntax at any point in the derivation in such structures (Williams, 1985, 1987; Jackendoff, 1987; Harley, 1995; Marantz, 1997; Kratzer, 2000; Embick, 1997, 2004; Kallulli, 2007, and others). Collins proposes that the participial morphology ('Part' in (38)) applies to VP while a passive voice head termed 'Voice' applies to the entire predicate, which in the present analysis is PrP. Voice then attracts PartP to [spec,VoiceP], 'smuggling' the internal argument of V past the external argument, by virtue of which it comes to be closer to the subject position [spec,TP] than the external argument, and by Minimality moves to the subject position instead of the external argument. Note that Collins' use of the term 'VoiceP' is different from Kratzer's (2000) and Harley's (2013) use; it does not introduce an argument, but merely affects a syntactic transformation. Collins further claims that the preposition *by* is optionally generated in the head Voice, licensing an overt argument in the subjacent specifier, here [spec,PrP]. The result of PartP movement to [spec,VoiceP] is shown in (38). In (38), the internal argument *these dishes* is closer to supervening positions such as [spec,TP] than the external argument *John*, since the category containing *these dishes*—PartP—asymmetrically c-commands *John*. Consequently, the internal argument *these dishes* will subsequently move to [spec,TP] once this inflectional structure has been merged. V concatenates with the participial suffix *-en* through head movement (not shown).

(38)
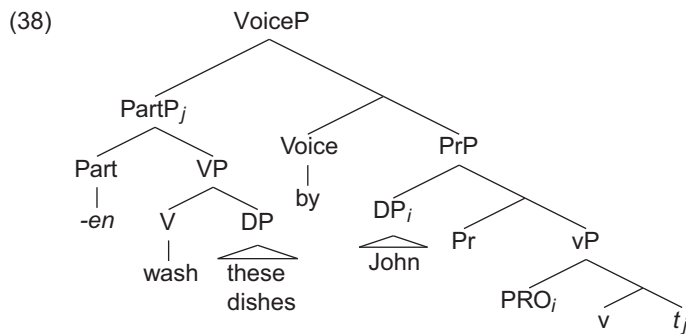
As mentioned above, I adopt in its essence Embick's claim that the verbal passive differs from the adjectival passive in the level of attachment of the passive morphology, which in Collins' analysis is the Voice head. Specifically, in the (resultant state) adjectival passive, the passivizing head Voice applies directly to vP, under PrP, yielding the base structure in (39).

(39)
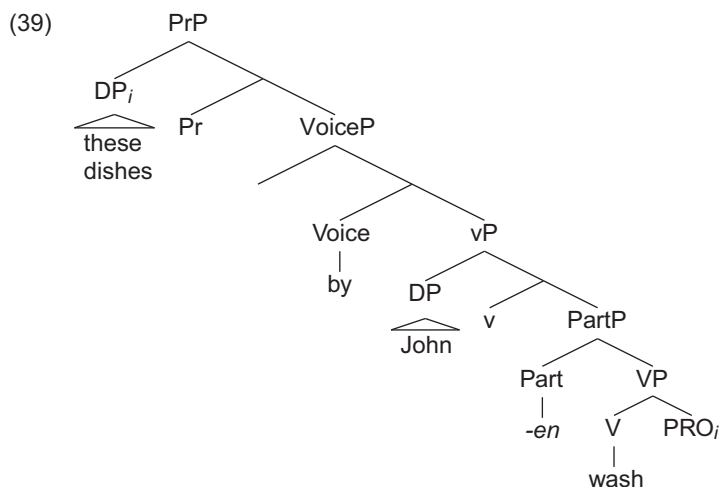
Though this structure itself displays the same minimality violation as (37) (the agent intervenes in the binding relation between the subject *these dishes* and theme PRO), PartP movement to [spec,VoiceP] obviates the violation. In the derivative in (40), PRO is closer to *these dishes* than *John* is.

(40)

```
                        PrP
                       /   \
                  DP_i      \
                 /    \      \
              these    Pr    VoiceP
             dishes         /     \
                      PartP_j      \
                      /    \        \
                  Part     VP    Voice    vP
                   |      /  \     |      /  \
                  -en    V   PRO_i by   DP    v   t_j
                         |              |
                        wash          John
```

The tree in (40) is the structure of the predicate underlying the adjectival passive construction in (28a) (*These dishes look washed by John*). In that sentence, *these dishes* moves from [spec,PrP] to the subject position [spec,TP] after merger of *look*. Here, too, *so* may replace the complement of Pr (here VoiceP), while Pr itself is null, as described in more detail in section 3.2.

The fact that resultant state adjectival participles but not verbal participles in English are subject to the particular interpretational idiosyncrasy that Maienborn identifies, formalized in (31), suggests that this interpretation is associated with the low position of VoiceP found in those contexts. That is, there is a Voice head in English with the interpretation in (31) and a limited distribution—it is selected by Pr and therefore cannot appear outside Pr, where verbal passives are formed. That adjectivization may be associated with different interpretations is proposed by Kratzer (2000), who derives resultant state and target state adjectives from two semantically distinct operators that share the same morphological form. Anagnostopoulou (2003) describes a type of adjectival participle in Greek in which *by*-phrases and agent-oriented adverbial phrases occur as productively as in verbal passives, but which has the interpretation that Kratzer attributes to resultant state participles, essentially that of a perfect construction. The data reviewed here indicate that the purely temporal perfect interpretation that Kratzer attributes to resultant state participles is in fact the interpretation of the particular morphology associated with such constructions in Greek (the verbal suffix *menos*), as Anagnostopoulou concludes, but that the Voice head that derives resultant state participles in German and English has the interpretation in (31), placing extra pragmatic demands on agent-oriented material in those cases, as Maienborn discusses. Since the verbal passive conveys neither the pragmatic demands of the resultant state passive nor its stativity, the higher Voice head that derives verbal passives is semantically vacuous.

Emonds (2000, in this issue) presents an analysis that seeks to derive parallels in the behavior of verbal and adjectival passives including their morphological homophony (including agreement with the deep object in some languages) and the selection of verbal passives in English by a set of auxiliaries that also select adjectives, including *be, get* and a small class of light verbs (see Emonds, in this issue). He proposes that participles are headed by an adjectivizing node that is visible in the syntax, deriving parallels in the distribution and morphological behavior of verbal and adjectival participles, but the morpheme *-en* that contributes the resultant state semantics of the adjectival participles may be optionally inserted into the adjectivizing node only after the structure has already been sent to the LF interface. If *-en* is inserted before the structure is sent to LF, its stative semantics are included in the semantic composition of the verb phrase at LF. If it is inserted only after the structure is sent to LF, the stative semantics associated with the adjectival passive is not included in the semantic composition of the predicate, and the underlying verbal character of the predicate is carried forward in the interpretation of the matrix verb phrase headed by the auxiliary, deriving the interpretation of the verbal participles. The analysis proposed in the present study 'structuralizes' Emonds approach by placing the adjectival participle-deriving morpheme lower in the structure than the verbal participle-deriving morpheme, meaning the morphology that derives the resultant state semantics is inserted earlier in the derivation here, just as in Emonds' approach. This analysis also parallels Emonds' in that the higher VoiceP, that derives the verbal participle, is semantically vacuous, since verbal passives inherit the aspectual type of the underlying verb. The present analysis posits two different VoiceP's with a different distribution and a different meaning. The morphological parallels between verbal and adjectival participles result from the fact that both VoiceP's require a PartP in their specifier, and the participial morphology is associated with PartP, not VoiceP. Collins in fact cites the morphological parallel between passive and perfect participles as evidence for the distinctness of passivization and participle formation. As in Emonds' analysis, therefore, the stativizing passive head applies here earlier than the non-stativizing passive head, but in contrast to his analysis, this difference is correlated with a difference in syntactic placement of the two heads.

While the existence of agent-incorporating passive participles (e.g. (35)) supports the claim that agent-licensing structure is found in passive participles, movement of PartP in Collins' analysis, which makes the internal argument more accessible to a higher landing site than the external argument, dissociates the participle from its agent in vP. Sportiche (2005) proposes that incorporation configurations arise when bare thematic material is generated in theta positions and

left there in the surface structure, analogous to the 'pseudo-incorporation' phenomenon described by Massam (2001). Along these lines, a possible explanation for the possibility of incorporation of an external argument in adjectival passives is that PartP movement is able to pied-pipe vP with a bare noun in [spec,vP], and that the theta-position [spec,vP] does not admit DP-level material in the absence of a governor (the preposition *by* in Voice in the verbal passives). In turn, the bare noun does not represent an intervener in the relationship between the subject in [spec,PrP] and the theme PRO in PartP by virtue of the lack of quantificational force otherwise associated with DP. The diagram in (41) represents the structure of the predicate in *Current interest rates seem inflation-driven* according to this proposal.

(41)
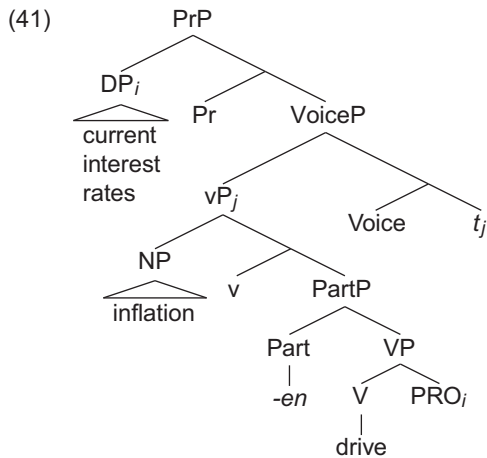
This approach to incorporation of an external argument in adjectival passive participles predicts incorporation to be impossible in verbal passive participles. In verbal participles, the subject in [spec,PrP] binds PRO in [spec,vP], just as in active structures (see (38)). Since the object position contains the actual object (not PRO) in the base structure for verbal passives, placing overt material in [spec,vP] altogether denies the subject in [spec,PrP] a bindee, as (42) illustrates, the base structure for the string *Current interest rates are being inflation-driven by low unemployment*. The tree in (42) clarifies that such a structure would contain three overt arguments but only two theta positions. Pied-piping of vP to [spec,VoiceP] will not resolve the problem that the subject *low unemployment* cannot link to a theta position; the tree is consequently ill-formed.

(42)
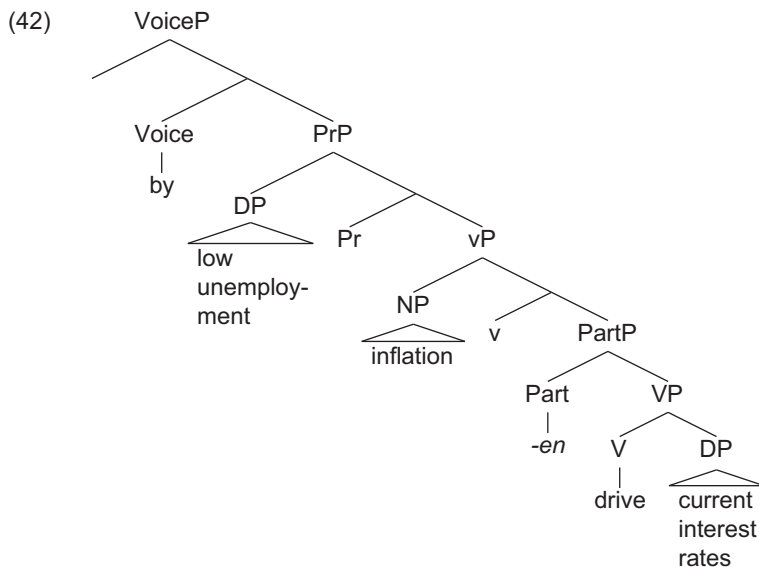
The prediction that such structures are ungrammatical is substantiated in (43), which shows that the participles in (35) are strikingly worse when they occur in the progressive, an environment that excludes states and therefore forces the verbal passive reading of a passive participle. The present analysis provides an explanation for this surprising contrast.

(43)   a.   *Current interest rates are being inflation-driven.
       b.   *The countryside is still being war-ravaged.
       c.   *New problems are constantly being technology-bred.
       d.   *This project is still being NSF-funded.
       e.   *The car is being lady-driven at the moment.
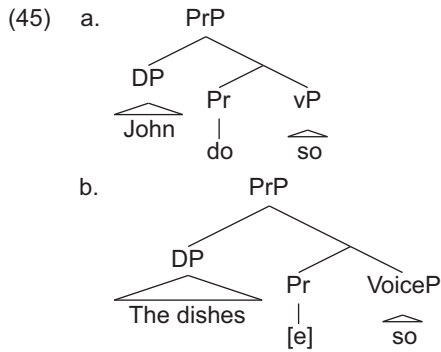   f.   *Pizza is being Sam-made in the kitchen.

Note that we can draw from the ungrammaticality of such structures the conclusion that PrP and its subject are obligatory; the ill-formedness of (42) apparently cannot be resolved by leaving out PrP. The *by*-phrase itself is of course not obligatory. Collins claims that unlike the preposition *by*, the empty Voice head fails to govern the subjacent specifier, in turn licensing PRO there, which receives an arbitrary reference interpretation, since no antecedent is available. Verbal participles with an incorporated external argument are ungrammatical even without the *by*-phrase, as the examples in (43) demonstrate, pointing to the presence of a covert external argument in verbal passives. The tree in (44) represents the structure of the predicate underlying (43a), which succumbs to the same configurational problem as the structure in (42) with an overt *by*-phrase. PRO$_{ARB}$ must bind a variable within the vP/VP complex, but no variable occurs there.
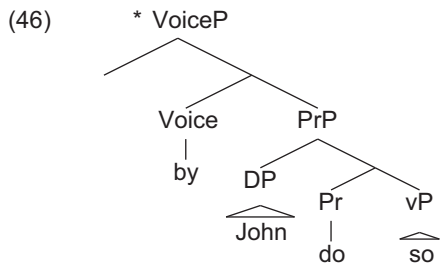
(44)
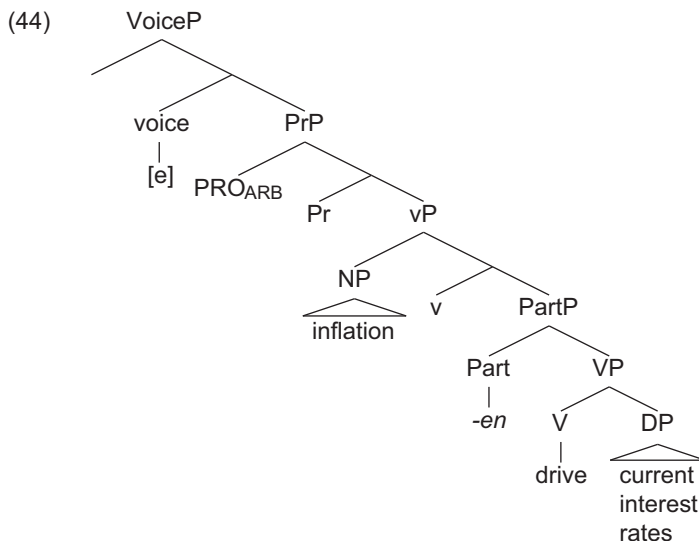
The analysis described here has in common with Embick's (2004) analysis that verbal and adjectival passives are derived at different levels of structure, and that, in particular, verbal passives are derived at a higher point in the structure than adjectival passives. It differs from his analysis in that it admits agents in (resultant state) adjectival passives, which the data in (25), (26), (27), (28), (30), (33) and (35) motivate. It differs as well in allowing externalization without movement in adjectival passives, which the *so* replacement facts in (10) and (19) motivate, but agrees with his analysis in attributing internal syntactic structure to adjectival passives, and in rejecting any role for the lexicon in externalization, which the facts in (18) justify. The following sections discuss the distribution of *so* and *do so* in more detail, and some additional predictions of the analysis presented here.

3.2. The distribution of *so* and *do so*

I propose that *so* replaces the complement of Pr and that *do* is a default placeholder that occurs in Pr when the complement of Pr is verbal (vP or VP, the latter in unaccusative constructions described in section 3.3), but that Pr is empty otherwise. In effect, the alternation *do/∅* in Pr marks the category of the constituent that *so* represents along the parameter verbal/non-verbal. In active constructions, obligatory movement of the (non-participial) verb itself to PrP, representing 'short' verb movement as described by Johnson (1991), Bowers (1993), Chomsky (1995) and others, obviates insertion of *do* when *so* is not present. But verb movement is not available in *so*-anaphora contexts, since no verb is base generated there. The structure of the PrP underlying the sentence *John did so* (e.g. washed the dishes) looks like (45a), while *the dishes are so* (e.g. washed by John) looks like (45b) (it is possible that Pr is the base site for the auxiliary *be* for the adjectival predicate in (45b), as Bowers, 2010 suggests).

(45)   a.

```
              PrP
             /   \
          DP       \
         /  \      / \
       John  Pr   vP
             |    |
             do   so
```

    b.

```
                PrP
               /   \
            DP       \
           /   \    /   \
     The dishes Pr   VoiceP
                |    |
               [e]   so
```

LF copying of the vP *wash the dishes* from a discourse antecedent into the position held by the anaphor *so* in (45a) results in the structure in (36). LF copying of the VoiceP *washed (by John)* into the position held by the anaphor *so* in (45b) results in the structure in (40). Indices in the antecedent are overridden in the copy in accordance with the general possibility of sloppy identity in predicate anaphora observed in (8). Any attempt to passivize the predicate *do so* itself, however, as in (11a), will not succeed, since no object can be promoted out of *so* (or to be exact, smuggled out via PartP movement), because *so* has no internal structure. Placing VoiceP above PrP in the tree in (45a) yields a tree like that (46), in which the syntactic feature of VoiceP that requires a PartP specifier cannot be satisfied, leading to an ill-formed derivation.

(46)

```
          * VoiceP
          /      \
      Voice       PrP
        |        /   \
        by     DP      \
              /  \     / \
            John  Pr   vP
                  |    |
                  do   so
```

3.3. Some predictions

This analysis makes some additional predictions beyond the fact that no passive derivative of *do so* exists. One is that since the subject of *(do) so* is generated outside the lexical argument structure of the verb (vP), *(do) so* should not be able to replace the predicate in a sentential idiom—one whose subject is part of the idiom. The examples in (47) and (48) demonstrate that this prediction is correct. The examples in (47) show that the predicate may be elided in a sentential idiom, stranding the subject idiom chunk. The examples in (48) show that *(do) so* replacement of the predicate is impossible in the same context.

(47)   a.   John said that if Mary saw me, the shit would hit the fan, without realizing that the shit already had.
      b.   John said that if Mary saw me, the cat would be out of the bag, without realizing that the cat already was.

(48)   a.   *John said that if Mary saw me, the shit would hit the fan, without realizing that the shit had already done so.
      b.   *John said that if Mary saw me, the cat would be out of the bag, without realizing that the cat already was so.

The facts in (47) and (48) are expected on the assumption that the subject of *(do) so* is not part of the full functional complex contained in vP, and that the idiomatic interpretation of sentential idioms is associated with vP (Koopman and Sportiche, 1991). These observations do mean, though, that the subject of a sentence is not always base generated external to vP, as in (47) or in the simple sentence *The shit hit the fan*, which instead involves movement of the external argument from [spec,vP] to [spec,PredP], as sketched in (49) (prior to subject raising to [spec,TP])

(49)   [$_{PrP}$ the shit$_i$ [$_{vP}$ t_i [$_{VP}$ hit the fan]]]

Another surprising prediction this analysis makes is that although idioms and passives do not allow *do so* replacement, unaccusative predicates do allow it, as the examples in (50) show. The examples in (50) contain a secondary predicate indicating that their surface subject is a deep structure object (Carrier and Randall, 1992; Levin and Rappaport Hovav, 1995).

(50) a. The river froze solid, and the pond did so, too.
      b. The towels dripped dry, and the socks did so, too.
      c. The pool drained empty, and the jacuzzi did so, too.
      d. The roses grew tall, and the sunflowers did so, too.

Other analyses of *do so* associate *do* with the presence of an agent. Ross (1972), Kratzer (1996), Stroik (2001) and Hallman (2004) claim that *do* is the default spell out of an agent-introducing head (little-v in the structures here) while *so* replaces its complement (big-VP in the structures here), thus accounting for the fact that the external argument is stranded in *do so* anaphora. The data in (50) belie this picture, since the subject of *do so* in these cases cannot be related to a predicate-internal position by movement. *Do so* here patterns uniformly with *do so* in agentive contexts in not allowing extraction of other internal arguments, for example a degree argument (51).

(51) a. The towels dripped drier than the socks did (*so).
      b. The roses grew taller than the sunflowers did (*so).

The proposal articulated here explains why unaccusative predicates are compatible with *do so* replacement while passive predicates are not. Unaccusative predicates lack an agent-hosting vP altogether, and therefore lack the agent that otherwise interrupts the dependency between the external subject and the internal theta position it must link to. The structure of a PrP containing an unaccusative verb phrase looks like (52). Since no movement dependencies cross out of VP, VP can be replaced by *so*, in which case *do* is inserted in Pr since its complement is verbal.

(52)
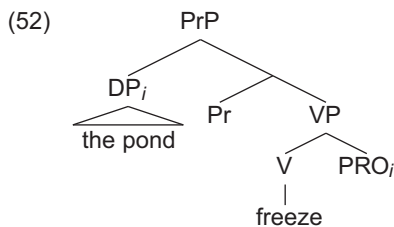
In light of the observation that the subject of an unaccusative verb may be generated in [spec,PrP], the explanation for the unpassivizability of unaccusative predicates with either promotion of the object (53) or expletive *it* (54) cannot lie in their lack of an external argument. Nothing said so far blocks the derivation in (55) for at least the cases in (54) (with late insertion of expletive *it* in [spec,TP]).

(53) a. *The passengers were recently arrived.
      b. *The shingle was fallen off the roof.

(54) a. *It was recently arrived by the passengers.
      b. *It was fallen off the roof by the shingle.

(55)
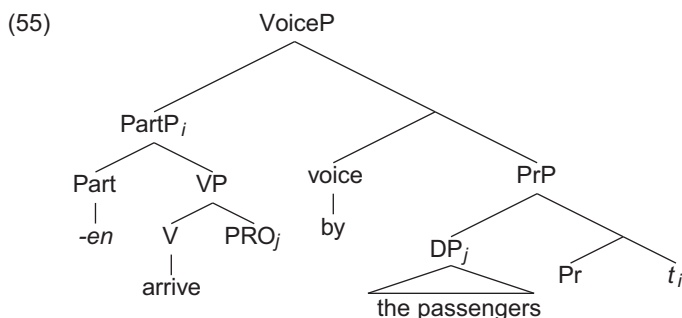
The derivation in (55) must instead be blocked by a restriction on movement of a constituent containing a bound variable (PRO) over its antecedent (*the passengers*), either as such or in the form of a requirement on the subject that it bind a variable in the derived structure as well as the base structure (see Müller, 1996 for a discussion of constraints on such configurations). If this is indeed the origin of the ungrammaticality of the examples in (54), the present analysis makes the prediction that unaccusative verbs should be licit as adjectival passives, though they are ungrammatical as verbal passives, since in the derivation of the adjectival passive of an unaccusative verb the object PRO does not cross over its antecedent. Rather, the landing site of PartP in such cases is still within the scope of the antecedent in [spec,PrP], as illustrated in (57). The prediction that adjectival passives of unaccusative verbs are grammatical is borne out, as the examples in (56) show (accordingly, the examples in (53) are grammatical when construed as adjectival passives; compare also the noun phrases *the recently arrived passengers* and *the fallen shingle*).

(56) a. Those passengers seem recently arrived.
      b. This shingle looks fallen off the roof.

(57)
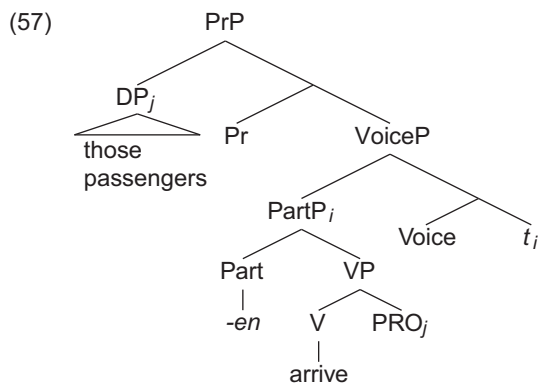
For similar reasons this analysis also generates a paradigm that has been taken to motivate the claim that adjectival passives lack agents altogether, namely that illustrated in (58).

(58) a. The children were washed.
      b. The children appear washed.

As Baker et al. (1989) point out, example (58a), understood as a verbal passive, cannot describe a situation in which the children washed themselves. The washer is understood as disjoint from the subject. Baker et al. claim that this interpretational fact demonstrates that (58a) contains a representation of the agent. If the promoted theme and the agent are co-referential, promotion of the theme over the agent results in a violation of the Strong Crossover constraint, which bars an operator from moving over a co-indexed pronoun (Postal, 1971; Wasow, 1972). The adjectival passive in (58b) is non-commital; it admits the possibility that the children washed themselves. Kratzer (2000) points out that this fact supports the claim that adjectival passives lack an agent that would induce a Crossover violation under raising of the theme.

On the present account, PartP movement to [spec,VoiceP] derives the structure in (59) for the adjectival passive in (58b), in which, along the lines that Collins proposes for the 'short passive', that is, passives without a *by*-phrase, the null Voice head (covert counterpart to the preposition *by*) fails to govern the subjacent agent, licensing PRO in [spec, PrP]. In this configuration, the theme PRO in PartP does not cross over its antecedent, which is the subject in [spec, PrP]. The theme PRO in PartP must be bound by *the children*, its closest potential antecedent. The agent PRO in [spec,vP] may also be bound by the c-commanding subject in [spec,PrP]. This indexation represents the reading in which the children have washed themselves. But since the requirement that the subject in [spec,PrP] bind a variable is satisfied by the theme PRO in PartP, the agent PRO in vP may fail to be incorporated into that chain. Since a PRO without a syntactic antecedent receives an arbitrary index (Chomsky and Lasnik, 1977:440), the 'j' reading in (59) is the arbitrary referent reading. This indexation represents the reading in which the children are washed by someone other than themselves.

(59)
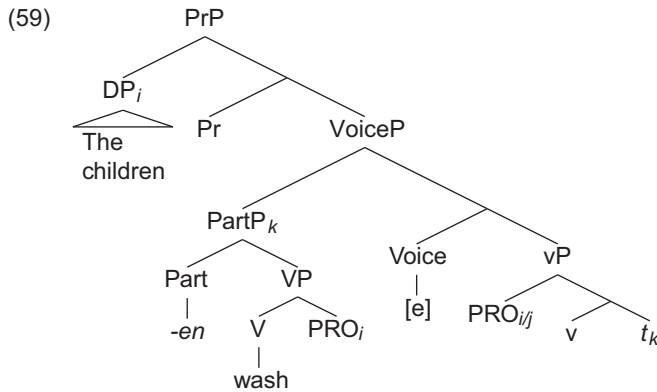
The structure of the verbal passive in (58a) is illustrated in (60). The deep object *the children* c-commands the agent PRO in vP in neither the base structure nor the derived structure illustrated there. The base structure represents a Principle C violation and co-reference is not possible in the derived structure since the arbitrary interpretation that PRO_j receives is not compatible with the individual-denoting interpretation of *the children$_i$*. Though the deep object subsequently undergoes movement to [spec,TP], this movement is not capable of altering the indexation that obtains at the derivational level of VoiceP, as expected in light of the fact that A-movement does not license parasitic gaps (cf. *John$_i$ was [killed t$_i$] [by a tree falling on [e]$_i$]*; Engdahl, 1983).

(60)
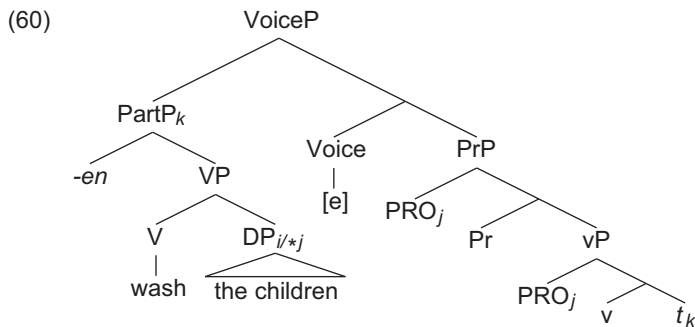
Another fact the present analysis predicts, in contrast to analyses that associate *do* in *do so* with little-v, is the fact that *do so* can subsume a constituent that includes the reiterative interpretation of the adverb *again* as part of its semantic composition, as pointed out by Ernst (2004). The adverb *again* in (61a) may presuppose either that Tori opened the door previously (which von Stechow, 1996 terms the 'reiterative' interpretation) or merely that the door was previously open (the 'restitutive' interpretation). Since the reiterative interpretation makes reference to the agent of the event it presupposes, that agent must be merged within the constituent that *again* modifies (on the assumption that the presupposition of *again* is specified by its syntactic sister), meaning that *again* is merged higher than vP. Since *do so* subsumes the adverb, it must subsume the whole vP on the reiterative interpretation of the adverb. But then *do so* is not expected to strand the external argument, unless that argument is base generated outside vP, as in the present analysis. In the present analysis, (61b) represents the reiterative interpretation of the first clause in (61a) and (61c) the restitutive interpretation. Either interpretation may antecede *so* in the second clause, since *so* stands for a vP in either case.

(61)   a.   Tori opened the door again; Mary did so, too.
       b.   [PrP Tori$_i$ [vP again [vP PRO$_i$ [VP open the door]]
       c.   [PrP Tori$_i$ [vP PRO$_i$ [vP again [VP open the door]]]]

Lastly, it bears mentioning that the present analysis provides no particular insight into the reason why *do so* does not readily accept a stative antecedent. It is worth noting, though, that the marginality of *do so* in place of a stative verb phrase is not as severe as sometimes reported in the literature. As Fiengo and May (1994:248) observe, *do so* in place of a stative verb phrase (62b) has an intermediate status between fully acceptable ellipsis (62a) and fully ungrammatical *do it* (62c) in the same context (examples and judgments are Fiengo and May's). See also Houser (2010).

(62) a. Max knows French, and Oscar does, too.
　　 b. ?Max knows French, and Oscar does so, too.
　　 c. *Max knows French, and Oscar does it, too.

Do it requires an agentive antecedent, indicating that *do* in *do it* is the English main verb *do* meaning *perform* or *accomplish*, found in expressions like *do one's homework* or *do cartwheels*. This *do* takes an agent and a nominal complement, which may be pronominal. The contrast to *do so* suggests that the incompatibility of *do so* with a stative antecedent is superficial, rather than reflecting a structural impossibility. Since the antecedent in (62b) is verbal, and therefore expected to license *do* in Pr, I conclude that these examples' marginality with *do so* arises from the fact that *so* replacement of the complement of Pr is not entirely compatible with the aspectual character of such predicates, which may also relate to the fact that, being dispositional or experiential, the argument structure of the antecedent VP in these cases differs from that of the kinds of canonical agentive predicates discussed here.

4. Conclusion

The analysis described above seeks to unify the significant commonality between adjectival and verbal passives, that both show externalization of an internal argument, while maintaining the significant distinction between them, that externalization involves movement in verbal passives but not in adjectival passives. In both cases, the passive morphology (Voice) facilitates promotion of the internal argument over the external argument. In the case of verbal passives, the internal argument moves over the subject in [spec,PrP] and proceeds to [spec,TP]. In the adjectival passive, the internal argument moves over the agent in [spec,vP] and is itself bound by the subject in [spec,PrP], essentially deriving externalization (linking of the subject to an internal theta role) without movement of the subject itself. This latter configuration is compatible with merger of *so* into the complement of Pr position, which precludes movement out of that position. Since the verbal passive is derived by movement of the internal argument out of the predicate, the verbal passive construction is incompatible with *so* in the complement of Pr, for which reason the PrP *do so* cannot be passivized. The analysis makes several surprising but correct predictions, notably that sentential idioms are not compatible with *do so* and yet that unaccusative constructions are, that unaccusative constructions and agent-incorporated transitives are compatible with adjectival passivization but not verbal passivization, that adjectival passives but not verbal passives allow co-reference between agent and theme, and that the adverb *again* may scope above the agent even when it is subsumed by the verb phrase anaphor *do so*.

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